Chapter 23
Emerging Technology Transfer, Economic Development and Policy in Africa

Alfred Kisubi
University of Wisconsin, USA

Chi Anyansi-Archibong
North Carolina A&T State University, USA

Ngozi C. Kamalu
Fayetteville State University, USA

Johnson A. Kamalu
Alabama A&M University, USA

Michael U. Adikwu
World Bank-Step-B Project and University of Nigeria, Nigeria

ABSTRACT

No nation can succeed economically without a strong and solid scientific educational base particularly in this era of knowledge economy. In many developing nations, the resources to develop both the human capital and infrastructure for education are inadequate. Specifically, in Africa, the intellectual capabilities on nanotechnology and microelectronics research and education are still evolving and some foundation technologies like electricity and ICT needed to drive and support them are not available. Lack of management efficiency and good governance continue to stall progress in the continent. In these matrixed four sub-chapters, these issues are discussed including a new model, Generic and Incremental Value (GIV), proposed for African development.

DOI: 10.4018/978-1-61692-006-7.ch023

THOUGHTS ON NANOTECHNOLOGY TRANSFER IN AFRICA- AN INTRODUCTION

Technological and social planning often have unanticipated outcomes. It is already very evident that science and technology would be very important in the search for solutions to the multitude of problems facing Africa. Nanotechnology has the potential to ameliorate the problems of hunger, disease and communication by making possible for African villages to have new suitable facilities in agriculture, healthcare and education. For success in the adoption and diffusion of this technology, it is very imperative that Africa develops indigenous capability. This will require huge commitment of financial and human resources to research and development by African governments, the private sector donors and nongovernmental organizations.

There are two outcomes in the developments and applications of nanotechnology in various areas that include information and storage, agricultural advancement, human enhancement, medical facilitation and drug administration, clean energy, sports, smarter cars, durable clothes, among others. They are intended outcomes (manifest functions) and the unanticipated outcomes (latent functions). A manifest function is the intended outcome of a technological change or visible act or outcome of a social behavior. But there are also unintended or unanticipated outcomes. These unanticipated outcomes, if they begin to significantly influence or change parts of a social system or society, are called latent functions. Latent functions are not often recognized when they occur and often not recognized. It is the duties of the African Union to help member nations to ensure nanotechnology is adopted and diffused safely and responsibly in the continent.

The critical shortage of the scientific and technical manpower on the continent calls for an arrangement that will enable the small groups of scientists and technologists in individual countries to collaborate effectively through the concept of network. With the close collaboration of the governmental and non-governmental institutions of higher learning Africa could establish effective working relations without having to spend a lot of money on new scientific and administrative facilities. Database technology must be used to increase access to sources of knowledge and information, provide access to a wide diversity of sources, and assist in the generation of new knowledge through increased access. The advent of information technology offers a competitive edge in analysis, full scale planning, and proposal competition, project development, marketing and sales. Therefore, Africans must work to make information technology affordable to individuals, grassroots organizations, schools and their economic institutions. Technology is power and Africa must exercise it.

There is a continuing acceleration in scientific and technological knowledge. It has been estimated the last 170 years have seen more advances in scientific/technological knowledge than took place in all of recorded history up to 1850. There have also been incredible advances in the application of this knowledge in industry, business, medicine, and social support systems such as utilities, fire and police. Hopefully, as emerging technologies become more available in Africa; Africans will harness the abundance of solar power for household consumption, industrial power and medical adaptive systems. The transcendental days, when Africans worshipped the Sun God, will be replaced by worship of nature.

A large part of the modern society is dependent upon technology. Our social structure rests on a foundation of complex scientific/technological support systems driven by fossil fuels. Dependency of this magnitude requires ever broadening technical applications of increasing efficiency, such as nanotechnology. In order to gain efficiency in application scientific/technological achievements has led to specialization. Efficiency and specialization lead to a consolidation in technology in which fewer component parts handle greater